

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application.

1. (Currently Amended) A detecting machine for scanning both sides of a sheet-like object fed in a scanning direction and optically detecting compositions of both sides of the object, the detecting machine comprising:

a first-side light emitting device and a first-side light detecting device disposed close to each other on a first side of the object, wherein

the first-side light emitting device ~~including~~ includes a plurality of light emitting elements emitting first light beams in respective different wavelength bands,

the first light beams are wider along a direction perpendicular to the scanning direction than along a direction parallel to the scanning direction, and

the first-side light detecting device has a light detecting area that is wider along the direction perpendicular to the scanning direction than along the direction parallel to the scanning direction;

a second-side light emitting device and a second-side light detecting device disposed close to each other on a second side of the object, wherein

the second-side light emitting device ~~including~~ includes a plurality of light emitting elements emitting second light beams in respective different wavelength bands,

the second light beams are wider along the direction perpendicular to the scanning direction than along the direction parallel to the scanning direction, and

the second-side light detecting device has a light detecting area that is wider along the direction perpendicular to the scanning direction than along the direction parallel to the scanning direction; and

an emission controller for controlling the first-side light emitting device and the second-side light emitting device so that respective light emitting elements of the first-side light emitting device and respective light emitting elements of the second-side light emitting device emit light at respective different emission times, wherein

the first-side light emitting device is disposed at a position opposite the second-side light detecting device, with the object between the first-side light emitting device and the second-side light detecting device,

the first-side light detecting device is disposed at a position opposite the second-side light emitting device with the object between the first-side light detecting device and the second-side light emitting device, and

in composite detection the first-side light detecting device detects first-side reflected light emitted from the first-side light emitting device and reflected from the first side of the object, and the second-side light detecting device detects transmitted light emitted from the first-side light emitting device and transmitted by the object and second-side reflected light emitted from the second-side light emitting device and reflected from the second side of the object, to detect the compositions of both sides of the object.

2. (Previously Presented) The detecting machine according to Claim 1, wherein the first-side light emitting device and the second-side light emitting device are disposed so that light beams emitted from the respective devices irradiate a substantially identical region of the object.

Claims 3 and 4 (Cancelled).

5. (Currently Amended) A validating machine including:
a detecting machine for scanning both sides of a sheet-like object in a scanning direction and optically detecting compositions of both sides of the object and comprising:

a first-side light emitting device and a first-side light detecting device disposed close to each other on a first side of the object, wherein

the first-side light emitting device ~~including~~ includes a plurality of light emitting elements emitting first light beams in respective different wavelength bands,

the first light beams are wider along a direction perpendicular to the scanning direction than along a direction parallel to the scanning direction, and

the first-side light detecting device has a light detecting area that is wider along the direction perpendicular to the scanning direction than along the direction parallel to the scanning direction;

a second-side light emitting device and a second-side light detecting device disposed close to each other on a second side of the object, wherein

the second-side light emitting device ~~including~~ includes a plurality of light emitting elements emitting second light beams in respective different wavelength bands,

the second light beams are wider along the direction perpendicular to the scanning direction than along the direction parallel to the scanning direction, and

the second-side light detecting device has a light detecting area that is wider along the direction perpendicular to the scanning direction than along the direction parallel to the scanning direction; and

an emission controller for controlling the first-side light emitting device and the second-side light emitting device so that respective light emitting elements of the first-side light emitting device and respective light emitting elements of the second-side light emitting device emit light at respective different emission times, wherein

the first-side light emitting device is disposed at a position opposite the second-side light detecting device, with the object between the first-side light emitting device and the second-side light detecting device,

the first-side light detecting device is disposed at a position opposite the second-side light emitting device with the object between the first-side light detecting device and the second-side light emitting device, and

in composite detection the first-side light detecting device detects first-side reflected light emitted from the first-side light emitting device and reflected from the first side of the object and the second-side light detecting device detects transmitted light emitted from the first-side light emitting device and transmitted by the object and second-side reflected light emitted from the second-side light emitting device and reflected from the second side of the object, to detect the compositions of both sides of the object; and

a determination validator for validating the object, based on the composite detection.

6. (Previously Presented) The validating machine according to Claim 5, wherein the detecting machine outputs validation signals from the first-side light detecting device and from the second-side light detecting device, and the validating machine further comprises an operation determiner for determining whether each of the validation signals output from the detecting machine is within a tolerance.

7. (Previously Presented) The validating machine according to Claim 6, wherein

the operation determiner determines whether a first-side reflection validation signal output from the first-side light detecting device, a second-side transmission validation signal output from the second-side light detecting device detecting the transmitted light, and a second-side reflection validation signal output from the second-side light detecting device detecting the second-side reflected light, are within respective tolerances, and

the determination validator validates the object, based on a determination by the operation determiner.

8. (Previously Presented) The validating machine according to Claim 5, wherein the first-side light emitting device and the second-side light emitting device in the detecting machine are disposed so that light beams emitted from the respective first-side and second-side light emitting devices irradiate a substantially identical region of the object.

9. (Previously Presented) The validating machine according to Claim 6, wherein the first-side light emitting device and the second-side light emitting device in the detecting machine are disposed so that light beams emitted from the respective first-side and second-side light emitting devices irradiate a substantially identical region of the object.

10. (Previously Presented) The validating machine according to Claim 7, wherein the first-side light emitting device and the second-side light emitting device in the detecting machine are disposed so that light beams emitted from the respective first-side and second-side light emitting devices irradiate a substantially identical region of the object.

Claims 11-13 (Cancelled).

14. (Previously Presented) The detecting machine according to Claim 1, wherein

the light emitting elements of each of the first-side light emitting device and the second-side light emitting device include respective light emitting devices emitting light within visible light and near infrared light bands, and

the emission controller controls emission of light by the first-side light emitting device and the second-side light emitting device so that light in the visible light band

and light in the near-infrared band is not simultaneously emitted by the first-side light emitting device or the second-side light emitting device.

15. (Previously Presented) The validating machine according to Claim 5, wherein

the light emitting elements of each of the first-side light emitting device and the second-side light emitting device include respective light emitting devices emitting light within visible light and near infrared light bands, and

the emission controller controls emission of light by the first-side light emitting device and the second-side light emitting device so that light in the visible light band and light in the near-infrared band is not simultaneously emitted by the first-side light emitting device or the second-side light emitting device.